

**Qualitative Project-level Hotspot Analysis in  
PM10 and PM2.5 Nonattainment and  
Maintenance Areas**

**Section IV: Developing a Hotspot Analysis**

**This Section Covers:**

- **What should be included in a PM hotspot analysis?**
- **What are the factors to be considered for existing conditions?**
- **How would changes in factors be evaluated for the future?**
- **Possible mitigation strategies**
- **Qualitative estimation examples**

### **Qualitative Estimation Techniques**

- ✓ **Comparison to another location with similar characteristics**
- ✓ **Air quality study approach**

## **Qualitative Estimation Techniques**

### **Comparison to another location with similar characteristics**

- Review existing highway/transit facilities built in location similar to proposed project
  - If possible, near an air quality monitor
- Should discuss similarities and differences between “surrogate” and proposed project location
- Document reasons for selecting “surrogate”
- Use interagency consultation to determine appropriate “surrogate” and air quality monitor(s)

## **Qualitative Estimation Techniques**

### **Air quality study approach**

- Use available air quality information/studies (state/local air agencies, universities, etc.)
- Use information in SIP (PM10) or preliminary data (PM2.5) for the area that may be relevant
- Document air quality information used, and its appropriateness
- Use interagency consultation to determine appropriate air quality information for assessing air quality impacts of proposed project

### **Analytical Considerations**

- The EPA/FHWA guidance describes a number of factors that should be considered in a qualitative analysis
- Not every factor will apply to every project
- Size or scope of project will dictate required documentation

**What should be included in a PM hotspot analysis?**

- Project description, including location, scope, and opening date
- Applicable part of 40 CFR 93.123(b)(1)
- Description of hotspot analysis method chosen
- Description of emissions considered
- Factors that would influence emissions and concentrations from the project, including current conditions and how they would change in the future
- Analysis year(s) considered
- Mitigation strategies, if any, and expected effects
- Conclusion (how project meets 40 CFR 93.116 and 93.123)

## **Documentation Q&A**

? How should a project-level conformity determination be documented that is not being made as part of the initial NEPA process?

- ✓ The project-level conformity documentation prepared by the project sponsor and the determination made by the FHWA Division office can be documented in a format consistent with other documents in the project files or Administrative Record. When appropriate, it is recommended that this project-level conformity determination is made in conjunction with the re-evaluation required under 23 CFR 771.129.

## **23 CFR 771.129 Reevaluations**

- (a) A written evaluation of the draft EIS shall be prepared by the applicant in cooperation with the Administration if an acceptable final EIS is not submitted to the Administration within 3 years from the date of the draft EIS circulation. The purpose of this evaluation is to determine whether a supplement to the draft EIS or a new draft EIS is needed.
- (b) A written evaluation of the final EIS will be required before further approvals may be granted if major steps to advance the action (e.g., authority to undertake final design, authority to acquire a significant portion of the right-of-way, or approval of the plans, specifications and estimates ) have not occurred within three years after the approval of the final EIS, final EIS supplement, or the last major Administration approval or grant.
- (c) After approval of the EIS, FONSI, or CE designation, the applicant shall consult with the Administration prior to requesting any major approvals or grants to establish whether or not the approved environmental document or CE designation remains valid for the required Administration action. These consultations will be documented when determined necessary by the Administration.



**Factors that may be considered in qualitative analysis  
for existing and future scenarios**

- ✓ **Air quality**
- ✓ **Transportation and traffic conditions**
- ✓ **Built and natural environment**
- ✓ **Meteorological, climate, and seasonal data**
- ✓ **Retrofit, anti-idling or other adopted emission  
control measures**

### **Air Quality**

- ✓ PM10 and PM2.5 design values from nearby monitors in the nonattainment/maintenance area
- ✓ PM10 and PM2.5 monitoring data from monitors in other nonattainment/maintenance areas with similar traffic or environmental conditions to proposed project
- ✓ Future projected air quality including attainment year, years beyond attainment, changes at project location
- ✓ PM source apportionment studies, where available
- ✓ Future emissions trends that could affect concentrations at the project location, such as stationary, port, or other sources
- ✓ Scientific studies or other regional/local trend data where available and applicable

### **Transportation and Traffic Conditions**

- ✓ **Current and projected volumes**
  - Types, percentages of diesel and other vehicles on affected roadways
  - Consider planned/expected development that may affect traffic volume growth rates
- ✓ **Changes in vehicle fleet characteristics (trends in VMT, mix of vehicles, etc.)**
- ✓ **Other: transportation modes, volumes, congestion, trends, etc.**

### **Built and Natural Environment**

- ✓ **Classification of project area (urban, suburban, rural)**
  - Relevant infrastructure/topography (i.e, barriers to PM dispersal)
- ✓ **Relevant development trends and land use patterns**
  - i.e., new area/stationary source, increased truck traffic due to port terminal or agricultural reasons

**Meteorological, Climate and Seasonal Data**

- ✓ **Atmospheric inversions, prevailing wind speed, wind direction**
- ✓ **Describe the effect these variables have on PM concentrations**

**Retrofit, Anti-idling or Other Adopted Emission Control Measures**

- ✓ Retrofit or anti-idling programs
- ✓ Impact of phase-in of national rules and regulations (e.g., heavy-duty diesel rules)
- ✓ Other emissions control measures, as relevant

### **Data Source Examples**

- ❖ **Air quality:** State/local air quality agencies, public health departments, universities
- ❖ **Transportation and traffic conditions:** Project sponsor, state department of transportation (DOT), local planning agency, MPO
- ❖ **Built and natural environment:** State DOT, project sponsor, local planning agency, MPO
- ❖ **Meteorological, climate, and seasonal data:** State/local air quality agencies, applicable SIP, National Weather Service
- ❖ **Retrofit, anti-idling, or other adopted emission control measures:** state/local air agencies, EPA, applicable SIP

### **Mitigation Strategies**

- Consider where the proposed project may lead to potential new PM violation or increase in frequency or severity of an existing violation
- Written commitments must be obtained for project-level mitigation before the project-level conformity determination. (40 CFR 93.125(a))
- Appendix C of the EPA/DOT guidance gives examples.



**Possible Mitigation Strategies: Diesel Emissions**

- **Retrofit for older, higher emitting vehicles**
- **Anti-idling requirements or policies**
  - Restrictions on idling
  - Truck stop electrification
- **Truck routing (e.g., truck restricted zone)**
- **Replace older buses with cleaner buses (i.e., new diesel engine standards, hybrid-electrics)**

**Possible Mitigation Strategies: Fugitive Dust (PM10)**

- Truck cover laws
- Street cleaning programs
- Site watering programs
- Street/shoulder paving
- Runoff and erosion control
- Changes in truck weight and length restrictions
- Use of alternative deicers in place of sand for snow/ice control

## **Examples**

- **Appendix B**
  - New major bus terminal
  - Major modification to highway interchange
  - New highway interchange
- **Real-life**
  - Legacy Parkway in Utah
  - I-25/E470 Interchange in Colorado

### **Comparison of a New Bus Terminal to Another Site Based on Monitoring Data**

- **Proposed Project:**
  - New major bus terminal along public transit route in PM2.5 nonattainment area
  - Rapidly growing suburban area
- **Air Quality Concern:**
  - Significant increase diesel bus traffic (40 CFR 93.123(b)(1)(iii))
- **Data Considerations:**
  - Road dust not considered; no significance finding by EPA/state
  - Nearby monitor: Significantly below 24-hr standard (50 ug/m3); close to annual standard (14.5 ug/m3)
  - Monitor near existing bus terminal with similar traffic characteristics to proposed project: Near 24-hr standard (60 ug/m3); violation of annual standard (15.1 ug/m3)
  - Project includes anti-idling policy and older bus retrofit program

### **Comparison of a New Bus Terminal to Another Site Based on Monitoring Data (con't)**

✓ **Conclusion:**

- Interagency consultation process concludes that mitigation measures should allow PM concentrations to be lower than standards.
- Mitigation measures allow the project to meet conformity hotspot requirements in 40 CFR 93.116 and 123.

### **Consideration of a Highway Project and Nearby Monitoring Data**

- **Proposed Project:**
  - Major modification to highway interchange connecting primary route to interstate
  - Significant number of diesel vehicles are expected to use the interchange
  - Located in suburban portion of large metropolitan city in PM10 and PM2.5 nonattainment areas
- **Air Quality Concern:**
  - New or expanded highway project that has a significant number or significant increase in diesel vehicles (40 CFR 93.123(b)(1)(ii))

### **Consideration of a Highway Project and Nearby Monitoring Data (con't)**

- **Data Considerations:**
  - Project's location does not have any current violations: Significantly below 24-hour PM2.5 and PM10 standards
  - PM2.5 and PM10 emissions from existing sources is decreasing in project area in the future
  - Road dust: not considered for PM2.5 (no significance finding); yes for PM10
  - VMT changes estimated for the project are consistent with regional trends which show no expected increase in PM concentrations
  - Meteorology at the project location is variable; some wind dispersion of PM emissions; no effect by temperature, humidity, rainfall

### **Consideration of a Highway Project and Nearby Monitoring Data (con't)**

#### **✓ Conclusion**

- Any increases in emissions due to traffic changes would be offset by decreases from the transportation facility due to decreasing on-road emissions trends and decreasing background concentrations
- A scientific journal article about the air quality impact of similar projects supports this conclusion. It was discussed in consultation and cited in the analysis documentation.
- The project meets the requirements in 40 CFR 93.116 and 123 for both PM<sub>2.5</sub> and PM<sub>10</sub>.



### **Comparison of New Highway Project to Similar Project Location in the SIP**

- **Proposed Project:**
  - New interchange on 6-lane freeway; at border of urban area
  - Located in PM10 maintenance area
  - Significant increase in diesel traffic from new connecting road and commercial/industrial development planning for vicinity
- **Air Quality Concern:**
  - New or expanded highway project that has a significant number or significant increase in diesel vehicles (40 CFR 93.123(b)(1)(i))

### **Comparison of New Highway Project to Similar Project Location in the SIP (con't)**

- **Data Considerations:**
  - PM10 SIP shows annual PM10 standard met as long as 24-hour PM10 standard is met
  - New interchange is compared to existing interchange within SIP's modeling domain. Existing interchange...
    - Is located near urban edge
    - Has similar meteorological conditions
    - Has higher diesel traffic volumes
    - Has more intensive surrounding development
  - Modeling grid for existing interchange is predicted to experience concentrations of about 110 ug/m<sup>3</sup> (current standard is 150 ug/m<sup>3</sup>).

### **Comparison of New Highway Project to Similar Project Location in the SIP (con't)**

#### **✓ Conclusion**

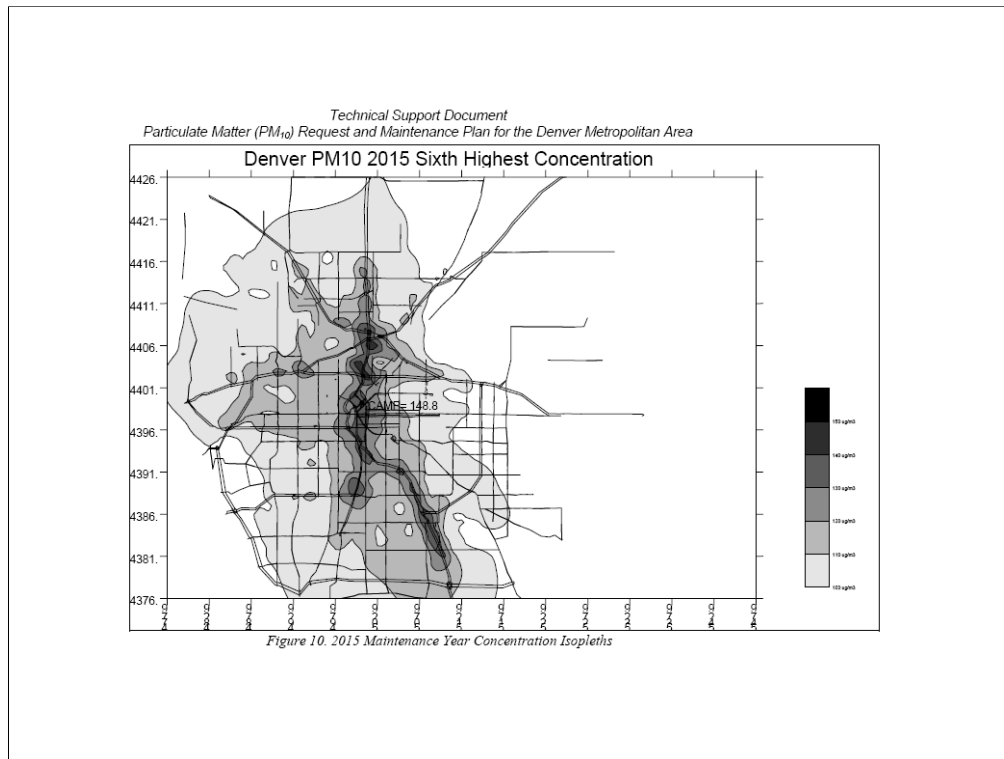
- New interchange would see lower traffic volumes and less development than existing, modeled interchange which is not predicted to experience any new or worsened violations of the 24-hour and annual PM10 standards.
- The project meets the requirements in 40 CFR 93.116 and 123.

### **Real-life Example: Legacy Parkway in Utah**

- Volumes on proposed Legacy Parkway compared to volumes on I-15 at a point ~ 100 yards from a PM10 monitor
- Volumes on I-15 ranged from 99,700 to 121,600 vehicles per day, with no violations at the nearby monitor (this is documented with data in the EIS)
- Volumes on Legacy Parkway are expected to be around 20,000 vehicles per day; since the higher volumes on I-15 don't cause a violation, Legacy wouldn't be expected to cause a violation either.

**Real-life Example: I-25/E470 Interchange (Denver area)**

- New interchange connecting I-25 and a new beltway; major retail/residential development planned
- Proposed project compared to Denver PM10 SIP modeling for a location with similar traffic patterns and development
- Since the comparison location was safely below the PM10 NAAQS in the SIP modeling, it was concluded that the proposed project would also be below the NAAQS



## **More Information**

**A listing of contacts for EPA, FHWA, and FTA is available in the qualitative guidance, found at:**

**<http://www.fhwa.dot.gov/environment/conformity/pmhotspotguidmemo.htm>**

**FHWA's Transportation Conformity website:**

**<http://www.fhwa.dot.gov/environment/conform.htm>**

**EPA's Transportation Conformity website:**

**<http://www.epa.gov/otaq/stateresources/transconf/index.htm>**

**FHWA Resource Center Air Quality Technical Services Team**

**<http://www.fhwa.dot.gov/resourcecenter/teams/airquality/index.cfm>**